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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

SMITH, JENNIFER A

ART UNIT

PAPER NUMBER

1793

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/519,696	Applicant(s) DUNSCH ET AL.	
	Examiner JENNIFER A. SMITH	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Application

Claims 1, 5, 10 and 11 have been amended.

Claims 12-16 have been added.

Claims 1-16 are pending and presented for examination.

Withdrawal of Claim Objections

The objects to claims 1 and 5 have been withdrawn. Informalities have been corrected.

Withdrawal of Claim Rejections - 35 USC § 112, 1st Paragraph

Rejection of claim 1 under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement, has been withdrawn in view of applicant's remarks.

Claim Rejections - 35 USC § 112, 1st Paragraph (New Matter)

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 12-13 and 15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to

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one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 12-13 and 15 are drawn to a method of synthesizing endohedral fullerenes. The specification does not have support for the use of ammonia or a carbon-containing gas as an inert component (Claims 12-13). Pages 3-4 of the specification only disclose ammonia as the reactive component and do not make mention of a carbon-containing gas (Claim 15).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraph of 35 U.S.C. 102 that forms the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-8 and 12-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Dorn et al. (US 6,303,760 B1).

Claims 1-8 and 12-16 are rejected on the same grounds as stated in the Office Action of October 1, 2007.

In regard to the amended features of claim 1, the *description of the preferred embodiments* of Dorn et al. (US '760 hereafter) teaches a method for making

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metallofullerenes using a Kratschmer-Huffman generator (arc reactor) [*column 4, lines 65-66*]:

- a potential is applied across graphite electrodes [*column 5, lines 59-60*]
- helium is introduced into the reaction chamber along with a small amount of nitrogen gas (gaseous atmosphere). [*column 5, lines 41-42*]
- here nitrogen is the reactive component

With regard to new claims 12-16, they contain all the limitations of claim 1 and additionally, the inert gas mixture includes an ammonia or carbon-containing gas. The reactive gas component is generated in the arc reactor (Claim 16).

US '760 teaches the typical approach for producing fullerenes which involves producing an arc discharge in an inert gas which forms a carbon plasma (gas) in which fullerenes are produced [See Column 1, lines 21-31].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dorn et al. (US '760).

Dorn et al. (US '760) is applied to the claim for the same reason as stated in the Office Action dated October 1, 2007.

Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dorn et al. (US '760) in view of Cain et al. (US Patent No. 6,787,794 B2).

US '760 teaches steps of the method claimed in claim 10 but fails to teach modifying the graphite electrodes with a metal cyanamide.

Cain et al. (US '794, hereafter) teaches a fullerene in Figure 2. US '794 teaches an ammonia molecule [15] is anchored inside the fullerene [16]. Fullerene molecules are formed in an ammonia atmosphere using graphite electrodes [See Column 11, lines 30-36]. Other molecules which have pyramidal structure such as cyanamide can be used as an alternative to the ammonia molecule.

One would have been motivated to include cyanamide-modified graphite electrodes in the process taught in US '760 because US '794 teaches the use of a pyramidal cyanamide molecule encased in an endohedral molecule. Such an arrangement produced by the processes disclosed in both references can be used as an improved quantum computer [See Column 3, lines 4-7 and 15-20].

Response to Applicant's Arguments

Applicant's arguments filed on 12/31/2007 have been fully considered but they are not persuasive.

First, Applicant argues that claim 1 contains subject matter which has been adequately described in the specification (specifically the examples) in such a way as to enable one skilled in the art to make and/or use the invention because one would be able to determine, without undue experimentation, whether a particular component is reactive or not. The examiner has withdrawn the rejection of claim 1 under 35 U.S.C. 112, first paragraph in view of applicant's remarks.

Second, Applicant argues that nitrogen is not disclosed a "reactive component" in Dorn et al. and is well-known to be an inert gas. However, Dorn et al. teaches charging a reactor with a first metal, carbon, and nitrogen and **reacting** the nitrogen, first metal,

and the carbon to form an endohedral metallofulleren [See Column 2, lines 9-12]. The nitrogen is in the form of reactive nitrogen gas [See Column 5, line 42].

Third, Applicant argues that methane is not a nitrogen containing gas and assumes the Office Action meant to state ammonia instead of methane. The Examiner confirms this assumption and its application to the rejection of claim 5. Applicant argues that there is no disclosure of ammonia being added to the invention of Dorn et al. Dorn et al. is not limiting with regards to the nitrogen source and discloses the source of nitrogen is preferably a nitrogen containing gas but may include other nitrogen sources [See Column 5, lines 54-57].

Forth, Applicant argues that because dependency of claims 10 and 11 from claim 1 has been removed, the claims are in condition for allowance. However, the amended claims necessitate the new grounds of rejection above and are no longer considered allowable.

Conclusion

Claims 1-16 are rejected.

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JENNIFER A. SMITH whose telephone number is

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(571)270-3599. The examiner can normally be reached on Monday - Friday, 8:30am to 5:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571)272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/
Supervisory Patent Examiner, Art
Unit 1793

Jennifer A. Smith
March 17, 2008
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JS